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A NEW JUMPING MOUSE (*ZAPUS PRINCEPS* ALLEN) FROM UTAH

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When Durrant wrote the Mammals of Utah, Taxonomy and Distribution (Univ. Kansas Publs. Mus. Nat. Hist., 6: 385–388, 10 August 1952), jumping mice were unknown from the La Sal Mountains of eastern Utah. Krutzsch also lacked specimens from here when he reviewed the North American Jumping Mice (Univ. Kansas Publs. Mus. Nat. Hist., 7: 375, 21 April 1954). During a collecting trip to these mountains in August, 1955, we trapped two of these mammals and since that time, despite intensive efforts, only three additional specimens have been obtained. Analysis of these five specimens reveals that they represent an undescribed subspecies which herein is given nominal recognition.

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All measurements are in millimeters and capitalized color terms are after Ridgway (Color Standards and Color Nomenclature, Washington, D. C., 1912). Financial assistance for this study was provided by the National Science Foundation under grants NSF-G339 and NSF-G1412.

Zapus princeps chrysogenys, new subspecies

Type: Adult male, skin and skull, number 13,834, University of Utah, Museum of Zoology; 2½ miles northeast of La Sal Peak, La Sal Moun-

tains, 8,500 feet, Grand County, Utah; 17 July 1956; collected by M. Raymond Lee; original number 1,436.

Range: La Sal Mountains of Grand and San Juan counties, Utah.

Diagnosis: Size: Small (see measurements). Color: Mid-dorsal dark stripe markedly reduced being indistinct in 3 of 5 specimens; dorsum and sides Pale Yellow-Orange to Pale Ochraceous-Buff with considerable admixture of black hairs; lateral line Capucine Buff; venter white, lightly washed with Pale Yellow-Orange to Pale Ochraceous-Buff; cheeks Pale Yellow-Orange to Capucine Buff without admixture of black hairs; tail bicolored, whitish below and grayish above; hind feet grayish-white to yellowish-white above; ears distinctly edged with yellowish-white. Skull: Small (see measurements); superior ramus of zygoma wide and robust; maxillary tooth-row long relative to length of skull; tympanic bullae small with medial ends directed anteromedially; antorbital foramen small; nasals wide; presphenoid wide; projection present on inferior ramus of zygoma.

Measurements: Average and extreme measurements of the type and 4 topotypes (3 ♂♂, 1 ♀), collectively, are as follows: Total length, 215.2 (232–203); length of tail, 131.2 (139–117); length of hind foot, 31 (32–30); greatest length of skull, 23.5 (24.8–23.0); length of nasals, 9.4 (10.2–9.1); length of incisive foramina, 4.6 (5.1–4.2); width across M1, 5.16 (5.4–4.9); length of maxillary tooth-row, 4.08 (4.15–4.0).

Comparisons: Topotypes of *Zapus princeps chrysogenys* differ from those of *Z. p. princeps* as follows: Size: Smaller; tail relatively longer. Color: Paler, mid-dorsal dark stripe not as distinct; cheeks with less admixture of black hairs; lateral line Capucine Buff as opposed to Light Ochraceous-Buff or Cinnamon-Buff; margins of ears lighter. Skull: Smaller in most measurements; superior ramus of zygoma wider and more robust; tympanic bullae smaller; incisive foramina more ellipsoid as opposed to nearly parallel-sided; presphenoid wider; maxillary tooth-row longer; antorbital foramen smaller.

Compared with specimens of *Z. p. luteus* from the West Fork of Black River, Apache County, Arizona, topotypes of *Z. p. chrysogenys* differ as follows: Size: Larger. Color: Markedly less Ochraceous; sides near Pale Yellow-Orange as opposed to near Cinnamon-Buff; tail grayish as opposed to brownish. Skull: Posterior ends of nasals wider; antorbital foramen markedly smaller; incisive foramina longer and wider posteriorly; tympanic bullae smaller; maxillary tooth-row longer; superior ramus of zygoma wider and heavier.

From near topotypes of *Z. p. utahensis*, topotypes of *Z. p. chrysogenys* differ as follows: Size: Smaller. Color: Lighter; mid-dorsal dark stripe less blackish and markedly less distinct; venter lightly washed with pale buff as opposed to pure white; distinct light cheek patch present as opposed to none. Skull: Markedly smaller; zygomata parallel rather than bowed laterally; inferior and superior rami of zygoma actually as well as relatively more robust; upper tooth-rows diverging less anteriorly;

palatal bridge longer relative to length of skull; presphenoid wider; tympanic bullae less inflated ventrally.

Remarks: The La Sal Mountains are completely isolated and are surrounded by desert. In Utah, jumping mice are restricted to mountains at the higher elevations; hence, this population is completely isolated because of the lack of montane habitat between the La Sal and the neighboring mountains. Comparisons clearly indicate that the affinities of Z. *p. chrysogenys* are with the Z. *p. princeps*–Z. *p. luteus* complex of jumping mice and not, as would be expected with Z. *p. utahensis,* the closest subspecies geographically. In order to evaluate more precisely the relationship of Z. *p. chrysogenys* with the Z. *p. princeps*–Z. *p. luteus* complex the following observations are presented. Although paler and more yellowish, specimens of Z. *p. chrysogenys* most nearly resemble those of Z. *p. princeps.* In external measurements, they are intermediate between those of Z. *p. princeps* and Z. *p. luteus.* Specimens of Z. *p. chrysogenys* are reminiscent of those of Z. *p. princeps* in the shape of the nasals and incisive foramina and approach those of Z. *p. luteus* in generally smaller cranial dimensions. All characters considered, the affinities of Z. *p. chrysogenys* are closer to Z. *p. princeps* than to Z. *p. luteus.*

The fact that Z. *p. chrysogenys* shows some characteristics of both Z. *p. princeps* and Z. *p. luteus* suggests that the initial population of the La Sal Mountains was derived from an ancestral population which also possessed these characters. That the ancestral population had these characters might be explained in two possible ways: either it consisted of animals having characters like intergrades between Z. *p. princeps* and Z. *p. luteus,* or it was characterized by animals ancestral to all three of these subspecies and had some characters of each kind.

Among these three subspecies, Z. *p. luteus* is the most widely divergent, and it is suggested that this divergence required a longer period of time than was required for the divergence between Z. *p. princeps* and Z. *p. chrysogenys.* In other words, differentiation of Z. *p. luteus* from Z. *p. princeps*–Z. *p. chrysogenys* had progressed to a considerable degree before the differentiation between Z. *p. princeps* and Z. *p. chrysogenys* was initiated. It is assumed that the time of isolation is approximately proportional to the degree of morphological differentiation. If this were true, then it suggests that Z. *p. chrysogenys* was derived from a population of Z. *p. princeps* in which some characters of Z. *p. luteus* were still present, that is, an intergrading population which has subsequently undergone divergence.

Krutzsch (op. cit.: 415) reported one specimen from Florida, Colorado, that was intermediate between Z. *p. princeps* and Z. *p. luteus* and that similar intergrades are known from localities in northern New Mexico. Florida, Colorado, is south of the Rico and San Juan mountains. Hence, the nearest affinities of the members of the species *Zapus princeps* on the La Sal Mountains, like those of the red squirrel (*Tamiasciurus hudsonicus* (Erxleben)) and the pika (*Ochotona princeps* (Rich-

ardson)) from the same region, appear to be with animals occurring on mountains to the southeastward in Colorado.

Specimens examined: Total, 5, distributed as follows: Grand County: 2½ mi NE La Sal Peak, La Sal Mtns., 8,500 ft, 1; Beaver Creek, 2 mi NE Mt. Waas, La Sal Mtns., 8,720 ft, 2; Beaver Creek, 1½ mi E La Sal Peak, La Sal Mtns., 9,000 ft, 2.